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SOLID WASTE MANAGEMENT OF DHAKA CITY: PUBLIC PRIVATE COMMUNITY PARTNERSHIP

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ABSTRACT

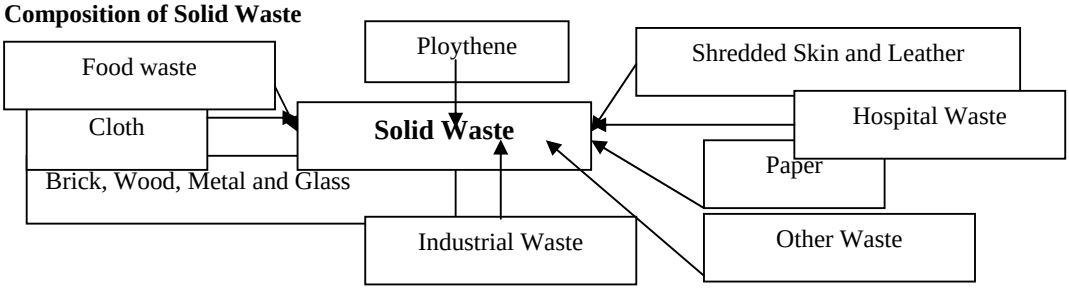
Urban solid waste management is considered as one of the most immediate and serious environmental problems confronting municipal authorities in developing Asian Countries. Although municipal authorities acknowledge the importance of adequate solid waste collection and disposal as well as resource recovery and recycling, it is mostly beyond their resource to deal effectively with the growing amount of solid waste generated by the expanding cities. Consequently solid waste is indiscriminate by dumped on roads and into open drains thus leading to serious health risk and degradation of living environment for millions of urban people. In the last decade, however, importance of community involvement in solid waste management and use of adapted technologies were recognized for improving the solid waste management system.

I. INTRODUCTION

Waste is an unavoidable by product of human activities Economic development, urbanization and improving living standards in cities, have led to an increase in the quantity and complexity of generated waste. Rapid growth of population and industrialization degrades the urban environment and places serious stress on natural resources, which undermines equitable and sustainable development. Inefficient management and disposal of solid waste is an obvious cause of degradation of the environment in most cities of the developing world. Municipal corporations of the developing countries are not able to handle increasing quantities of waste, which results in uncollected waste on roads and in other public places. There is a need to work towards a sustainable waste management system, which requires environmental, institutional, financial, economic and social sustainability.

Dhaka, the Capital City of Bangladesh, is expanding rapidly turning it into a mega city with an enormous growth of population at a rate of around 6 percent a year. Solid wastes are being generated at a faster pace, posing a serious management threat. Rapid growth of industries, lack of financial resources, inadequate trained manpower, inappropriate technology and lack of awareness of the community are the major constraints of solid waste management for the fast growing metropolis of Dhaka. A healthy life, cleaner city and better environment are the logical demands for the city dwellers as the municipality is traditionally funded for solid waste services from municipal tax system for waste collection and disposal. Due to limited finances and organizational capacity, it has been really difficult for the municipality to ensure efficient and appropriate delivery of solid waste collection and disposal services to the entire population.

Composition of Solid Waste



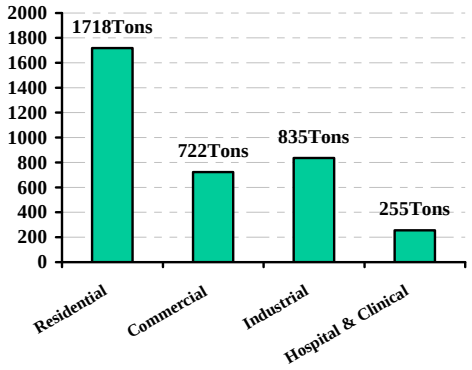
Evolution of Solid Waste Collection Method & Technique

Year	System of Collection
1717	Manual night soil collection system
1864	Night soil collection by bullock cart by Dhaka Municipality
1963	Liquid waste collection by DWASA & Dhaka Municipality side by side
1982	Bullock cart system suspended, night soil collection replaced by Septic tank, introduction of open truck for solid waste collection by Dhaka Municipality.
1989	Introduction of night time waste collection instead of day time collection.
1993	Demountable container introduced along with closed and open truck.
2002	Open truck replaced by covered truck.

Sold Waste management by DCC

- DCC sweeps roads & drains daily.
- Accumulate wastes from roadside.
- Cleaners collect & transfer to the nearest dustbin/container.
- DCC's truck dump to the dumping depots.
- Dressing by bulldozers, tire dozers, pay loaders & excavators.

Solid Waste generation Per Day



Impact of Solid Waste Disposal on Environment

- Open air dumping creates unhygienic and poses enormous threat to the people.
- Causes aesthetic problem and nuisance due to nauseating pungent odor.
- Promotes spreading of diseases.
- The situation further aggravated by the indiscriminate disposal of Hospital and Clinical Waste.
- Presence of extremely high level of Total and Facial coliform.
- Pollute water bodies.
- Carbon dioxide and Methane produced from solid waste are extremely harmful to the environment.
- Gases are produced in the landfills through aerobic and anaerobic decomposition of organic compounds, which are threat to the environment.

REASONS THAT LED TO PARTNERSHIP

Citizens have since realized that municipal efforts to solve the waste problem are not sufficient and as such they have started working something on their own initiatives. The communities have started to organize their own informal waste collection services for keeping their localities clean. In the community-arranged system, wastes are being collected from households and carried to the nearby municipal roadside containers. The community-managed house-to-house waste collection service is gaining momentum in Dhaka City and gradually expanding into a major environmental movement. In Dhaka City, more than 170 communities of varying sizes (less than 50 to more than 300 households) have stared this participatory intervention. The system has already increased garbage collection coverage by 20 percent of the generated waste and created approximately 500 jobs and proven to be appropriate for addressing local problems.

II. PROCESS FOR IDENTIFYING PARTNER

Waste Concern, a local NGO, has been first in Dhaka to start with community-based, decentralized composting of the organic portion of the waste. This innovation has had an encouraging response from local people as they have participated in source separation and doorstep waste collection. It is encouraging that the Community Based Organizations (CBOs), NGOs and the entrepreneurs have already come forward with innovative program to deal with the growing solid waste problem. The emergence of neighborhood waste collection or community-based recycling is not, on its own, a complete or sustainable solution. To make the different

initiatives sustainable, it is required to make a linkage between the initiatives.

Dhaka City Corporation has recently arranged a partnership between a government organization and a non-government organization i.e. a GO-NGO co-operation to look for an economically sustainable solution for the management of wastes. The main objectives of the program are:

1. To organize door to door collection of wastes for ensuring a better living environment,
2. To launch an awareness program on environmental sanitation and personal hygiene,
3. To convert the wastes into useful eco-friendly compost in order to reduce transportation cost,
4. To save landfill space and promote economic benefit.

The community based composition project integrated with the door-to-door solid waste collection service can not only solve disposal problem at source but also yield environmental, economical and social benefits both for the municipality and for the community. (Currently compost is being used in different Nurseries of Dhaka City. A private company is using organic compost blended with fertilizer.)

SOLID WASTE GENERATION IN BANGLADESH

1995:10742 tons/day
2001:17000-tons/ day
2025:4.064 tons/day (estimated)

III. THE STATE OF ART OF SOLID WASTE MANAGEMENT IN DHAKA CITY

Dhaka City Corporation is the only formal organization responsible for waste management in an area of 360 sq. km. with a population of 7 million. The waste generation for this area is estimated to be around 3000 to 4000 tones every day. Of this quantity 40-50 percent is collected efficiently and the rest is left. It is broadly estimated that between 14-17 percent of the total municipal budget is used for solid waste management corresponding to approximately Tk. 26/- (0.5 US$) per capita each year. The number of cleaners per thousand populations in Dhaka is nearly 1.0. Waste densities (350 to 450 Kg/m3) and moisture contents (50% to 70%) by weight are much higher than that of the wastes in industrialized countries. The solid waste of Dhaka generally has a high organic content (60% to 70%) and a low proportion of combustible matter.

Normally residents bring their refuse to nearby communal bins/container located in the street, whilst in some specific areas communities have arranged house-to-house collection of garbage by their own initiatives and efforts. Household, commercial, institutional and medical wastes are deposited in the same waste collection bins located beside the streets. Street sweeping is done manually and debris is loaded from the kerb-side into handcarts and delivered to the street storage facilities. In the down town areas, where the roads and lanes are narrow, the wastes are transported by two types of trucks i.e. either flat-bedded open vehicles or trucks with closed bodies (with shutters that slide vertically on both sides). In the new part of the City, a container system where containers are lifted hydraulically is working. Every vehicle has its own designated areas and routes for collecting wastes. The wastes, which remain uncollected, are dumped in open spaces, street and drains, clogging the drainage system, which create serious environmental degradation and health risks. The collected waste is presently being disposed of mainly in a low-lying area about 3 kilometers from the corporation area. There are few number of minor sites also which, are operated in an uncontrolled manner without any proper earth cover or compaction. In Dhaka, wastes, which have market value, are being reclaimed or salvaged for recycling. Recycling contributes to resource conservation as well as environmental protection. Recycling of paper, plastic, glass, metal etc. plays a very important role in the economic sphere and a large number of poor people are dependant on it for their livelihood. The major component of municipal waste i.e. organic food waste-is totally ignored even though it has potential value and can be converted into organic fertilizer.

PROCESS OF NEGOTIATION IN THE PARTNERSHIP

The partnership program between Dhaka City Corporation and Waste Concern is being implemented under the “Community-Based Urban Solid Waste Management” program, a sub project of the Sustainable Environmental Management Program (SEMP) of the Ministry of Environment & Forests with support fro the United Nations Development Program (UNDP). The partnership

arrangement of the pilot program has been designed with the responsibilities allocated as follows:

Dhaka City Corporation

- Provide land for composting
- Water supply, Lighting and boundary wall for security
- One conservancy supervisor and two cleaners to learn the composting technique

Waste Concern

- Plan and design the project, collect wastes from the nearby staff quarters of DCC, provide collection vans
- Install 1 ton capacity compost plant
- Conduct training and awareness-raising activities on proper waste separation and management
- Operation and monitoring of the project
- Market development for the compost
- Documentation and information destination in relation to the project benefits and activities

United Nations Development Program (UNDP)

- Provide start up funds for the project

Community

- Provide start up funds for the project
- Pay the service charge for the door-to-door waste collection service

BENEFITS OF PARTNERSHIP-BASED WASTE MANAGEMENT

- A clean and healthier environment for the citizen
- Participatory approach through willingness to pay, raising awareness towards cleanliness, changing household practices towards throwing wastes from the windows of apartments
- Labor intensive, indigenous, creation of employment opportunities for the poor
- Enhance social mobility and integrity through participation in different awareness program (observance of cleanliness campaign days, meetings of welfare association)
- Create a strong sense of community spirit through formation of a green force from the members of the community to work as watchdog
- Scope for documentation & dissemination of information regarding the project benefits and activities to other communities
- Increase institutional competence and capacity through getting hands-on training in waste management
- Reduce burden on the formal sector, contribute to a reduction in waste disposal costs
- Facilitation of transfer of indigenous technologies to municipalities and communities
- Reduce health hazards associated with wastes on roadsides, prevents unhygienic waste picking from communal bins

IV. PROBLEMS ENCOUNTERED IN IMPLEMENTING THE PROGRAMME

The initial problems that found when starting to implement the program were-

- Scarcity of land in the area of the community
- Lack of interest shown by the municipal authority in providing valuable land for recycling
- The municipal authority had an impression that micro-level initiatives could not help to solve the solid waste problem in the city
- The initiatives were not properly received by the municipal authority as they were afraid than their activities could be undermined
- Municipality was less interested to put any effort into small-scale recycling projects
- Chemical fertilizer is available to farmers, and as such there had been an absence of a wider market for organic compost
- Source separated waste is hard to get from the household since the community has a poor understanding of the composting process

SOLUTIONS FOR IMPLEMENTATION

- As it is difficult to get land for recycling near the community, entrepreneurs should be encouraged and enabled to get lease of government land
- Recycling has both tangible and intangible benefits, the intangible benefits should be quantified or clearly presented to help the

municipality understand the importance of recycling

- Compost should be supplied free of charge initially to community to encourage their interest in participation
- Source-segregated waste is essential for good quality compost, so households should be motivated accordingly
- The importance of organic compost should be well demonstrated to farmers by the Ministry of Agriculture

V. LESSONS LEARNT FROM THE EXPERIENCE

The following recommendations need to be made for improvement of the collaboration program-

- Municipal ordinance on waste management should include waste recycling as a treatment option prior to disposal
- Modification of municipal ordinance is needed to accommodate the inclusion of NGOs, CBOs, and micro enterprises into the main stream of Solid Waste Management SWM.
- Public awareness of waste segregation, recycling and reuse should be raised through public campaigns and media demonstrations through NGOs
- Community-based organizations should be given support to organize co-operatives and micro enterprises to effectively handle small0scale waste recycling
- The Ministry of Agriculture should develop good markets for organic compost
- The Municipality should facilitate innovative, community-based programmes rather than capital-intensive projects.

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